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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
IBRAHIM, MEDINA AHMED	

ART UNIT	PAPER NUMBER
1638	

DATE MAILED: 11/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/980,043	CHIANG ET AL.	
	Examiner	Art Unit	
	Medina A Ibrahim	1638	

-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 August 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *47-166* is/are pending in the application.

4a) Of the above claim(s) *48,51-66,88-125 and 135-148* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *47,49,50,67-87,126-134 and 149-166* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

In view of Applicant's canceling of all previously pending claims 1-46 and adding new claims 47-166, the previous restriction requirement has been modified as set forth below.

This application contains the following inventions or groups of inventions, which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 47, 49-50, 67-87, 126-134, and 149-166, drawn to an isolated nucleotide sequence having specific sequences encoding cellulose synthase, transgenic plant comprising said nucleotide sequence and a method of using said nucleotide sequence.

Group II, claim(s) 48, 51-60, 88-90, 135-148, and 107-121, drawn to a cellulose synthase promoter, a vector and a transgenic plant comprising said promoter, and a method of using said promoter .

Group III, claim(s) 61-66, drawn to an isolated polypeptide.

Group IV, claim(s) 91-106 and 122-125, drawn to a method of using a DNA encoding a protein that binds to MSRE of a cellulose synthase promoter to increase cellulose biosynthesis.

The invention of Group I is taught in the prior art as evidenced by Applicant's admitted prior art on page 3, second and third full paragraphs, of the specification (Pear et al. (1996), Arioli et al. (1998), and Wu et al. (1998). Applicant's admitted prior art teach isolated nucleotide sequences encoding a cellulose synthase. The prior art sequences inherently comprise the nucleotide sequences of parts (c)- (e). See also WO/9818949 (Applicant's IDS) who teaches a method of expressing an isolated nucleotide sequence encoding a cellulose synthase in transgenic plants to modify the plant growth characteristics (see at least pages 13-14, 25-30, and Examples 7-8). Therefore, the special technical feature relating to all Groups I-IV, i.e., cellulose synthase does not define a contribution over the prior art. Therefore, Groups I-IV lack unity of invention.

Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Election/Restrictions

1. Applicant's election with traverse of Group I (claims corresponding to previous Group IV) filed on 8/23/03 and 04/28/03 is acknowledged. The traversal is on the ground(s) that the polynucleotide of Group I, the promoter of Group II, the polypeptide of Group III, and the method of Group IV are all related to a cellulose synthase, and therefore, the groups are linked by a single technical feature, i.e., the cellulose synthase. Applicant argues that no evidence of search burden has been substantiated. Applicant cites Annex B of Appendix A1 of the MPEP and MPEP 803 to support this position. This is not found persuasive for the following reasons: firstly, the only special technical feature that relates inventions listed as Groups I-IV is the cellulose synthase, which was known in the art before Applicant's invention. Therefore, the special technical feature that relates Groups I-IV does not define a contribution over the prior art. Secondly, since this application is filed under 35 USC 371, the claims are not evaluated for unity of invention using the guidelines set forth in MPEP Chapter 800. With respect

to Annex B of the PCT Administrative Instructions, the example was provided in a very narrow set of facts to indicate how unity of invention may be applied. The example is not dispositive of every application claiming DNA and protein inventions under the unity of invention standard.

The requirement is still deemed proper and is therefore made FINAL.

Claims 47-166 are pending.

Claims 47, 49-50, 67-87, 126-134, and 149-166 are under examination.

Claims 48, 51-66, 88-125, and 135-148 are withdrawn from consideration as being drawn to a non-elected invention.

Sequence Listing

This application contains sequence disclosures that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 CFR 1.821(a)(1) and (a)(2). However, this application fails to comply with the requirements of 37 CFR 1.821 through 1.825 for the reason(s) set forth on the attached Notice To Comply With Requirements For Patent Applications Containing Nucleotide Sequence And/Or Amino Acid Sequence Disclosures.

The sequence Listing filed 11/19/01 has been entered. However, the sequences on page 11, line 29, and at claim 127, have not been identified by SEQ ID NO: Applicant is respectfully requested to identify the sequences presented on page11 and at claim 127, or to submit a new Sequence Listing which comprises said sequences. Applicant is also required to amend the specification to include the SEQ ID NO: for said sequences. In addition, the sequence listings of SEQ ID NO:4 and 5 in both the Paper

and CRF, do not match the SEQ ID NO: 4 and SEQ ID NO:5 in the specification.

Correction is required.

Drawings

Drawings filed on 11/19/01 are approved by the Examiner.

Claim Objections

Claims 68, 126, and 149 are objected to because of the following informalities: The claims recite "at least one " and "combinations thereof" which are redundant. Also, "control" plant and " that is not transformed" are redundant. Appropriate correction is required.

New Matter

Claims 47, 49-50, 73-81, and 154-161 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a NEW MATTER rejection.

Claims 47, 73 and 154 recite "a truncated nucleotide sequence .... encoding a functional domain of cellulose synthase". However, support for the limitation "truncated nucleotide sequence" cannot be found in the specification or in the claims as originally filed. Therefore, the limitation is considered to be a new matter. Applicant is requested to point to support for the limitation in the originally filed specification or to delete the New Matter in response to this rejection.

Claim Rejections - 35 USC § 112

The following is a quotation of the **second** paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 47, 49-50, 73-81, and 154-161 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 47, 73 and 154 are indefinite in the recitation of a "truncated nucleotide sequence" . The specification fails to define the phrase, and hence what is encompassed by the claims is unknown. Appropriate correction to more clearly define the metes and bounds of the claims are required. Claims 49-50, 74-81 and 155-161 do not obviate the rejection, and therefore are included in the rejection.

Claim Rejections - 35 USC § 112

The following is a quotation of the **first** paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 47, 49-50, 67-87, 126-134, and 149-166 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the isolated nucleotide sequences of SEQ ID NO:1 and 4, nucleotide sequences encoding SEQ ID NO:2 or 5, a vector and transgenic plants comprising said nucleotide sequences, and a method of transforming plants with said nucleotide sequences, does not reasonably provide enablement for an isolated polynucleotide comprising a conservative variant or a truncated nucleotide sequence of SEQ ID NO:1 or 4 encoding

a functional domain of cellulose synthase, a conservative variant or a truncated nucleotide sequence encoding a UDP-glucose binding domain, a polynucleotide encoding a polypeptide comprising at least 75% amino acid similarity to SEQ ID NO: 2 or 5 or a functional conservative variant thereof, and a method of altering a plant growth characteristics with said nucleotide sequence . The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

Applicant broadly claims an isolated polynucleotide comprising a conservative variant or a truncated nucleotide sequence of SEQ ID NO: 1 or 4 encoding a functional domain of cellulose synthase, a conservative variant or a truncated nucleotide sequence encoding a UDP-glucose binding domain, and transgenic plants including angiosperm and gymnosperm tree species comprising said nucleotide sequences. The claims are also drawn to a polynucleotide encoding a polypeptide comprising at least 75% amino acid similarity to SEQ ID NO: 2 or 5 or a functional conservative variant thereof. The claims are further drawn to a method of altering plant characteristics with said nucleotide sequences, wherein the characteristics include accelerated growth, increased cellulose content, decreased lignin content, improved strength of juvenile wood and fiber, and combinations thereof. The claimed method encompasses antisense and sense expression of said nucleotide sequence with respect to a promoter.

Applicant teaches isolation of nucleotide sequences encoding a cellulose synthase from developing secondary xylem tissues of aspen (*Populus tremuloides*) trees (SEQ ID NO:1 encoding SEQ ID NO:2) and from Arabidopsis (SEQ ID NO:4

encoding SEQ ID NO:5). Applicant also teaches that the Arabidopsis cellulose synthase shares 63-85% identity and 72-90% similarity in the amino acid level sequence identity with other Arabidopsis cellulose synthase; while the aspen cellulose synthase shows 90% amino acid sequence similarity with cellulose synthases from cotton, and 71% with the Arabidopsis cellulose synthases (Page 25-26, Example). Applicant further teaches three different constructs comprising either the aspen cellulose synthase full-length cDNA or the UDP-glucose binding domain sequence operably linked in sense or antisense orientation with respect to CaMV 35 S or aspen 4CL-promoter, and 35S-GUS constructs as controls (pages 31-32). Transformation of aspen and tobacco plants with said constructs resulted in transgenic plants with faster growth activity, i.e., increased height and diameter, and internode elongation as compared to control plants. Transgenic plants carrying the UDPG-35S construct showed the fastest growth activity (Table on page 33).

Applicant has not taught the obtention and use of all the polynucleotide sequences of claims 47 and 67 (parts (c) and (e) for the production of transgenic plants having altered characteristics. The breadth of the claims encompasses modified sequences comprising multiple base substitutions and deletions of SEQ ID NO: 1 and 4 that retain cellulose synthase activity. However, Applicant has not provided guidance for any modifications to SEQ ID NO: 1 or 4 that resulted in a sequence conservative variant, a function conservative variant, or a truncated sequence capable of encoding a functional cellulose synthase or a polynucleotide encoding a polypeptide having 75% amino acid identity to SEQ ID NO: 2 or 5 that retains the desired function, especially

when expressed in transgenic plants. Substantial guidance is required for which regions in SEQ ID NO: 1 and 4 would tolerate such multiple modifications. In the absence of such guidance, undue trial and error experimentation would be required to make all possible nucleotide substitutions and deletions in the 3Kb nucleotide sequences of SEQ ID NO: 1 and 4 and test all nucleotide sequences that meets the structural limitations, and to determine which also meet the functional limitation.

While mutagenesis techniques are known, it is not routine in the art to screen for multiple substitutions or multiple modifications as encompassed by the instant claims. One skilled in the art would expect any tolerance to modification for a given DNA/protein to diminish with each further and additional modification or multiple substitutions/ deletions. In addition, making "conservative" substitutions does not usually produce predictable results. See, for example Lazar et al (Mol. Cell. Biol., Vol. 8, pp. 1247-1252, 1988(U)) who teach that the conservative substitution of glutamic acid for aspartic acid at position 47 reduced biological function of transforming growth factor alpha, while "nonconservative" substitutions with alanine or asparagine had no effect (see at least the Abstract).

Regarding claims 68, 126 and 149, Applicant has provided no guidance with respect to specific primers/probes and hybridization/wash conditions or PCR conditions which would allow successful identification and isolation of nucleotide sequences encoding functional cellulose synthase or UDP-glucose binding domain from other plant and non-plant sources. In the absence of such guidance, undue and trial and error experimentation would be required to screen through vast number of plant and non-

plant cDNA and genomic clones to identify the target nucleotide sequences encoding functional polypeptides. Undue experimentation would also be required to evaluate the ability of each of said nucleotide to alter plant characteristics including altered growth, altered cellulose/lignin content, altered strength of juvenile wood and fiber in transgenic plants.

Since the workings examples disclosed in the specification are limited to unmodified SEQ ID NO: 1 and 4, and the sequence encoding the UDPG-binding domain of SEQ ID NO: 2 or 5, the ability of said nucleotide sequences to encode a functional cellulose synthase cannot be extrapolated to any sequence conservative variant or a truncated sequence thereof, and any nucleotide sequence encoding a polypeptide comprising 75% similarity to SEQ ID NO: 2 or 5 or a function conservative variant thereof; absent specific guidance.

Therefore, given the breadth of the claims; the lack of guidance as discussed supra; the unpredictability with regard to sequence modifications; and the limited working examples, the claimed invention is not enabled throughout the broad scope. *In re Wands (858F.2d 731, 8 USPQ2d 1400 (Fed. Cir. 1988)*

See *Amgen Inc. Chugai Pharmaceutical Co. Ltd.*, 18 USPQ 2d 1016 at 1027 (Fed. Cir. 1991) where the court held that the disclosure of a few gene sequences did not enable claims broadly drawn to any analog thereof.

Written Description

Claims 47, 49-50, 67-87, 126-134, and 149-166 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicant broadly claims any and all isolated polynucleotide sequences comprising sequence conservative variants or truncated nucleotide sequences of SEQ ID NO: 1 or 4 encoding a functional domain of cellulose synthase, conservative variants or truncated nucleotide sequences encoding a UDP-glucose binding domain, and transgenic plants comprising said nucleotide sequences. The claims are also drawn to any and all nucleotide sequences encoding a polypeptide comprising at least 75% amino acid similarity to SEQ ID NO: 2 or 5 and functional conservative variants thereof. The claims are further drawn to a method of altering plant growth characteristics with said nucleotide sequence. The claims also encompass methods that employ a nucleotide sequence from any source encoding a cellulose synthase or a UDP-glucose binding domain thereof.

Applicant describes the isolated nucleotide sequences of SEQ ID NO: 1 or 4, nucleotide sequences encoding SEQ ID NO: 2 or 5, nucleotide regions encoding the UDP-glucose binding domains of the cellulose synthase of SEQ ID NO: 2 or 5, and transgenic plants comprising said sequences. Applicant also describes a method of expressing said cellulose synthase sequences in transgenic plants.

University of California v. Eli Lilly and Co. 43 USPQ2d 1398 (Fed. Cir. 1997) states "A description of a genus of cDNA may be achieved by means of a recitation of a

representative number of cDNAs, defined by nucleotide sequence, falling within the scope of the genus or of a recitation of structural features common to members of the genus, which features constitute a substantial portion of the genus. See also where the court teaches that the disclosure of a process for obtaining cDNA from a particular organism and the description of the encoded protein fail to provide an adequate written description of the actual cDNA from the organism which would encode the protein from that organism, despite the disclosure of a cDNA encoding that protein from another organism.

Applicant has not described all nucleotide sequences from any source comprising conservative variants or truncated nucleotide sequences of SEQ ID NO: 1 or 4 encoding a functional domain of cellulose synthase, and all conservative variants or truncated nucleotide sequences encoding a UDP-glucose binding domain. Applicant has not described a single variant of SEQ ID NO: 1 or 4 having both the structural and functional characteristics as recited in the claims.

A nucleotide sequence encoding a cellulose synthase or a UDP-glucose binding domain is described only function. There is no known correlation between the structure and function of a cellulose synthase or a UDP-glucose binding domain sequence. Applicant has not described structural features common to all cellulose synthases, which would allow one skilled in the art to envisage what will be the identity of the nucleotides sequences of the genus claimed. Note, the nucleotide sequence of part (d) of claims 47, 73, and 154; and parts (c) and (e) of claims 67, 82, and 162, do not recite function, and therefore lack adequate written description. Therefore, the disclosure of

SEQ ID NO: 1 and 4 encoding SEQ ID NO: 2 and 5 are not a representative number of sequences of the genus claimed. Therefore, the specification fails to adequately describe the polynucleotides as broadly. Consequently, the specification has not provided an adequate description for vectors comprising said sequences, plants transformed with said vector, and methods of altering plant growth characteristics with said nucleotide sequences.

Given this lack of description of representative species encompassed by the genus of the claims, the specification fails to sufficiently describe the claimed invention in such full, clear, concise, and exact terms that a skilled artisan would recognize that Applicant was in possession of the invention as broadly claimed at the time of filing.

Therefore, weighing all factors above, the claimed invention does not meet the current written description requirements. See, also Written description Examination Guidelines published in Federal Registry/Vol. 66, No.4/Friday, January 5, 2001/Notices).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 47, 49-50, 67-87, 126-134, and 149-166 are rejected under 35 U.S.C. 102(b) as being anticipated by Arioli et al (WO 98/00549, Applicant's IDS).

Claims are drawn to an isolated polynucleotide sequence comprising a nucleotide sequence encoding a UDP-glucose binding domain, a conservative variant a truncated sequence of SEQ ID NO:1 or 4 encoding a functional domain of cellulose synthase, or a polynucleotide encoding a polypeptide comprising 75% similarity to SEQ ID NO:2 or 5, a vector and plant comprising said sequence. The claims are also drawn to a method of transforming plants including gymnosperm and angiosperm plants with a nucleotide sequence encoding cellulose synthase or a UDP-glucose binding domain to alter characteristics including accelerated growth, cellulose and lignin content, improved juvenile wood strength and fiber, and combinations thereof. The claims also encompass CaMV 35S, 4CL, or cellulose synthase promoter.

Arioli et al teach isolated DNAs from Arabidopsis, rice, wheat, barley, Brassica, cotton, and Eucalyptus ssp encoding a cellulose synthase and UDP-glucose binding domain, plant promoters such as cellulose synthase promoter and CaMV 35S, and methods of expressing said DNA in sense and antisense orientation with respect to said promoters in transgenic plants including cotton, *Eucalyptus ssp* and *Pinus ssp*. The cited reference also teaches transgenic plants with increased cellulose content and decreased lignin content or vice verse, increased strength or fiber. The cited reference further teaches the conserved QXXRW domain of the catalytic subunit of cellulose synthase (pages 16-19 and 26-28, Examples 9-18). The cellulose synthase DNAs disclosed by Arioli would inherently comprise a truncated and conservative variant of SEQ ID NO: 1 and 4. Therefore, Arioli teaches all claim limitations. In addition, on pages 25-26 of the specification, Applicant admitted that the aspen cellulose synthase

(SEQ ID NO:2) shows 90% amino acid sequence similarity with cellulose synthase from cotton of the prior art; while the Arabidopsis cellulose synthase (SEQ ID NO:5) shares 63-85% identity and 72-90% similarity in the amino acid level, with other Arabidopsis cellulose synthases of the prior art.

Claims 47, 49-50, 67-87, 126-134, and 149-166 are rejected under 35 U.S.C. 102(b) as being anticipated by Stalker et al (WO 98/18949, Applicant's IDS).

Stalker et al teach isolated DNAs from cotton encoding a cellulose synthase and independent UDP-glucose binding domain, constructs comprising said DNAs operably linked in sense or antisense orientation to a plant promoter, and transformation methods of cotton and *Populus* species with said constructs to improve cotton and wood quality, respectively (pages 8-9, 13, Examples 6-7). The cited reference teaches conserved domain QXXRW of the UDP-glucose binding domain, cotton cellulose synthase promoter, and transgenic plants comprising said DNAs (pages 24 and 29-30). The cellulose synthase DNAs disclosed by Stalker encodes a polypeptide comprising more than 86% amino acid similarity with Applicant's SEQ ID NO: 2 (see attached Sequence Search Result, Accession no. T10797, pages 1-2) and would inherently comprise a truncated and conservative variant of SEQ ID NO:1 and 4. Altered characteristics such as increased cellulose content, decreased lignin, accelerated growth, and improved strength will be inherent properties of transgenic plants expressing a DNA encoding cellulose or UDP-glucose binding domain. Therefore, Stalker et al disclose all claim limitations. In addition, on pages 25-26 of the specification, Applicant admitted that the aspen cellulose synthase (SEQ ID NO:2) shows 90% amino acid sequence similarity

with cellulose synthase from cotton of the prior art; while the Arabidopsis cellulose synthase (SEQ ID NO:5) shares 63-85% identity and 72-90% similarity in the amino acid level, with other Arabidopsis cellulose synthases of the prior art.

Remarks

The nucleotide sequence of SEQ ID NO: 1 and 4 and nucleotide sequences encoding SEQ ID NO: 2 and 5 are deemed free of the prior art of record.

No claim is allowed.

Papers related to this application may be submitted to Technology Sector 1 by facsimile transmission. Papers should be faxed to Crystal Mall 1, Art Unit 1638, using fax number (703) 308-4242. All Technology Sector 1 fax machines are available to receive transmission 24 hrs/day, 7 days/wk. Please note that the faxing of such papers must conform with the Notice published in the Official Gazette, 1096 OG 30 (November 15, 1989).

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Medina A. Ibrahim whose telephone number is (703) 306-5822. The Examiner can normally be reached Monday-Thursday from 8:30AM to 5:30PM and every other Friday from 9:00AM to 5:00PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Dr. Amy Nelson, can be reached at (703) 306-3218.

Any inquiry of a general nature or relating to the status of this application should be directed to the receptionist whose telephone number is (703) 308-0196.

11/16/03
Mai

Medina A. Ibrahim